



## **Marine Fishes**

### **Bottomfishes**

**Ulua aukea or  
Giant ulua**  
*Caranx ignobilis*

**Black ulua**  
*Caranx lugubris*

**Butaguchi or Thick or Pig ulua**  
*Pseudocaranx dentex*

**Kahala or Amberjack**  
*Seriola dumerii*

**Giant grouper**  
*Epinephelus lanceolatus*

**Hāpu‘u or Hawaiian grouper**  
*Epinephelus quernus*



**Lehi**  
*Aphareus rutilans*

**Uku or Jobfish**  
*Aprion virescens*

**Ula‘ula or Ehu**  
*Etelis carbunculus*

## **Ula‘ula koa‘e or Onaga**

*Etelis coruscans*

## **Goldflag jobfish**

*Pristipomoides auricilla*

## **Opakapaka**

*Pristipomoides filamentosus*

## **Kalekale**

*Pristipomoides seiboldii*

## **Ukikiki or Gindai**

*Pristipomoides zonatus*

### **SPECIES STATUS:**

IUCN Red List – Vulnerable (giant grouper)

Near Threatened (Hawaiian grouper)

Others Not considered

**SPECIES INFORMATION:** Ulua aukea, black ulua, butaguchi, and kahala are jacks (Lutjanidae); the giant grouper and hāpu‘u are sea basses (Serranidae); and onaga, ehū, kalekale, opakapaka, gindai, goldflag jobfish, lehi, and uku are snappers (Lutjanidae). All of these bottomfishes are included in the Western Pacific Regional Fisheries Management Council’s (WPRFMC) Bottomfish and Seamount Fisheries Management Plan. This plan also includes the snapper *Lutjanus kasmira* or ta‘ape; however, this is an introduced species in Hawai‘i and thus is not included in our Species of Greatest Conservation Need list. All jacks are agile, strong swimming predators. The ulua aukea is a “near-apex” predator that feeds on a large array of prey including parrotfishes, ‘ōpelu, wrasses, big eyes, eels, cephalopods, and crustaceans. They primarily feed nocturnally, but may also feed to a lesser extent during the day. Black ulua feed primarily on fish, while kahala feed on octopus and other bottom dwelling prey in the Northwestern Hawaiian Islands and feed within the water column in the Main Hawaiian Islands. Groupers are ambush predators of other fishes and crustaceans. Snappers also are carnivorous and their diets consist primarily of fishes, crustaceans and cephalopods. Some species such as the kalekale, opakapaka, and onaga have a broader diet. Onaga feed close to the bottom and are morning feeders as are the ehū. Opakapaka are nocturnal feeders and uku are daytime feeders. Most bottomfishes are slow-growing and long-lived; however,

the jacks are relatively fast growing. Female ulua aukea and kahala are reproductive at four years of age. Male and female ulua aukea spawn in pairs. Spawning occurs during new and full moon periods, and peaks in summer from May to August. Kahala spawn from February to June. More than one clutch may be produced in a year for both ulua aukea and kahala. Ulua aukea eggs hatch 24 to 48 hours after spawning and larvae are pelagic. Juvenile ulua aukea can recruit into estuaries and can be found in areas with salinities as low as 1.5 parts per thousand. Groupers are often protogynous hermaphrodites, starting life as female and changing sex to male later in life. For most snappers, maximum spawning occurs during the summer months and peaks from July to August. Opakapaka, onaga, uhu and uku, however, may spawn “serially” over an extended time period. Ehu have the shortest and most defined spawning period lasting from July to September. Snapper eggs are small and pelagic, hatching 17 to 36 hours after spawning. Larvae are estimated to remain in pelagic waters from 25 to 47 days. These species range in size from the kalekale that reaches a maximum of 55 centimeters (two feet) to the giant grouper that can reach 2.7 meters (nine feet).

**DISTRIBUTION:** All species can be found throughout the State, although they are currently much rarer, especially the giant grouper. Ulua aukea are more abundant and larger in the Northwestern Hawaiian Islands (NWHI). Butaguchi are also more common in the NWHI.

**ABUNDANCE:** Ulua are looked for in surveys of coral reef fishes in the Main and Northwestern Hawaiian Islands, both by the National Oceanic and Atmospheric Administration (NOAA) and the Division of Aquatic Resources (DAR). Commercial landings have varied over the past few years for ulua aukea and black ulua, but show no overall decrease, though longer-term declines have occurred. From 1999 to 2003, ulua aukea landings range from a low of approximately 2,700 kilograms (6,000 pounds) in 2000 to a high of 5,000 kilograms (11,000 pounds) in 2003. black ulua landings range from a low of approximately 120 kilograms (260 pounds) in 1998 to a high of 680 kilograms (1,500 pounds) in 2003. Butaguchi landings are highly variable but average around 13,600 kilograms (30,000 pounds) per year with no declining trend. Kahala commercial landings also have varied but have shown a decrease from 2000 to 2003 with landings of approximately 6,600 kilograms (14,500 pounds) and 2,540 kilograms (5,600 pounds), respectively.

Groupers also are looked for in surveys of coral reef fishes in the MHI and NWHI, both by NOAA and DAR. A recent survey in shallow reefs of the main islands found no individuals of either grouper species. Commercial landings in recent years have been about 18,000 kilograms (40,000 pounds) a year for the hāpu‘u. Overall landings in the past few years are lower in the main islands and the Hoomalu zone. Catch Per Unit Effort (CPUE) has been decreasing for the past 40 years in the main islands. Size of fish caught in the main islands is 30 to 40 percent less than those caught in the NWHI.

Commercial landings in recent years have been about 2,270 kilograms (5,000 pounds) a year for gindai. Uku landings have varied from approximately 53,500 kilograms (118,000 pounds) in 1998 to 50,800 kilograms (112,000 pounds) in 2001 to 61,700 kilograms (136,000 pounds) in 2003.

Other species have shown declines in commercial catch. Opakapaka commercial landings have decreased each year for the past six years from 102,500 kilograms (226,000 pounds) in 1998 to 60,300 kilograms (133,000 pounds) in 2003. Ehu landings have gone from approximately 18,100 kilograms (40,000 pounds) 1998 to 10,900 kilograms (24,000 pounds) in 2003. Lehi and kalekale landings have been declining since 2000, although less dramatically. Onaga and goldflag jobfish values were not recorded over this time period by DAR. Over the last 40 to 50 years partial CPUE's for onaga, ehu and hāpu'u has been reduced to half of what it was.

**LOCATION AND CONDITION OF KEY HABITAT:** Jacks have a variety of habitat preferences. Ulua aukea key habitat includes all nearshore habitats from rocky shores to embayments and reefs. They also occur in deeper waters up to 100 meters (300 feet) deep. Shallow waters over reefs and open waters are key foraging habitats. Juveniles prefer protected habitats such as sand flats and lagoons; however, many juveniles also utilize estuaries, although they are not "estuarine-dependent." Black ulua key habitat is off reef slopes in waters deeper than 30 meters (100 feet). Butaguchi occur in deep waters around the MHI and prefer banks and deep slopes. Key foraging grounds are near the bottom of deeper waters. Kahala inhabit areas with a large range of depth from nearshore to waters over 350 meters (1,100 feet). Hāpu'u were probably historically found in shallower water but are now only found in water deeper than 100 meters (300 feet) in the Main Hawaiian Islands with occasional sightings of juveniles in diving depths. In the NWHI, juveniles and adults have been seen as shallow as five meters (15 feet). Giant grouper are usually found from 12 meters to 60 meters (40 to 200 feet) deep. They can often be found in caves or overhangs. Most snappers inhabit intermediate to deep waters ranging anywhere from 30 meters to 4,570 meters (100 feet to 15,000 feet). Specifically, they prefer areas of high relief and deep slope with hard substrates and complex structures. Uku, however, are found in shallower waters than any of the other snappers. Opakapaka are known to migrate to shallower waters from 30 to 80 meters (100 to 250 feet) at night. Onaga often prefer areas close to or on the bottom of vertical drop-offs, pinnacles and ledges. Key habitat for juvenile snappers varies. Juvenile opakapaka, onaga and lehu prefer flat areas of shallower waters with few features, while ehu juveniles prefer habitats with carbonate, basalt, or mudstone substrate.

#### **THREATS:**

- Localized heavy fishing pressure threatens these bottomfishes. All jacks are fished commercially and recreationally; however, kahala is not of high commercial value due to its toxicity from ciguatoxin. Ulua aukea are also fished for subsistence by Native Hawaiians. Ulua aukea populations in the Main Hawaiian Islands are documented as depressed. Hāpu'u are fished commercially and recreationally, while giant grouper are too rare to be targeted commercially. Size of groupers caught in the Main Hawaiian Islands (MHI) is about half that of those caught in the less-intensively fished NWHI. The protogynous sex-change in this family makes them particularly vulnerable to fishing pressure. All eight snapper species also are fished commercially and recreationally; however, the gindai is not a considerable part of the commercial bottomfish fishery. Ehu and onaga are considered locally depleted in the MHI, while all

bottomfish populations are considered “relatively healthy” in the NWHI. Additionally, NMFS recently made a declaration of “overfishing” for all of Hawaii’s bottomfish;

- Additionally, coastal water quality may negatively affect uluas, especially juveniles that spend time in estuaries;
- Global climate change has been suggested to affect their abundance and their prey.

**CONSERVATION ACTIONS:** Since 1998, seven species of bottomfish have been managed by DAR under special Hawai‘i Administrative Rule 13-94. The rule limits fishing to hand lines only and establishes zones where bottomfishing is prohibited. Kaho‘olawe has its own fishing regulations. In the NWHI, the bottomfish are managed under the WPRFMC Bottomfish Fishery Management Plan, which limits fishing there. Additionally, in response to NMFS declaration of “overfishing” for Hawaii’s bottomfish, the WPRFMC has resolved to review a variety of different management alternatives and will probably decide to take action on these at their meeting in March 2006. In addition to common statewide and marine conservation actions, specific actions include:

- Collaborate with the Western Pacific Regional Fisheries Management Council to decrease fishing effort in response to the declaration by NMFS of “overfishing” for Hawaii’s bottomfish;
- Increase and improve data gathering on recreational bottomfish fishery;
- Consider increasing the number or location of Marine Protected Areas to protect bottomfishes;
- Improve coastal water quality to protect juvenile habitat;
- Maintain healthy populations with appropriate fishing regulations, enforcement, and education.

#### **MONITORING:**

- Continue surveys of population and distribution in known and likely habitats.

#### **RESEARCH PRIORITIES:**

- Improve understanding of factors affecting population size and basic ecology and biology of these species.

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